VESDA VLQ

Product Guide

VLQ-100

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Scope

The VESDA VLQ Product Guide provides a comprehensive description of the VLQ detector.

This guide introduces the VESDA VLQ features, technical specifications and gives an understanding of its components and their function. You will also find instructions on installing, cabling and powering up the detector.

This guide is for anyone involved with the design, maintenance and purchasing of a VESDA VLQ system. It is assumed that anyone using this product has the knowledge and appropriate certification from local fire and electrical authorities.

Document Conventions

The following typographic conventions are used in this document:

Convention	Description
Bold	**Used to denote:** emphasis. Used for names of menus, menu options, toolbar buttons
Italics	**Used to denote:** references to other parts of this document or other documents. Used for the result of an action.

The following icons are used in this document:

Convention	Description
	Caution: This icon is used to indicate that there is a danger to equipment. The danger could be loss of data, physical damage, or permanent corruption of configuration details.
	Warning: This icon is used to indicate that there is a danger of electric shock. This may lead to death or permanent injury.
	Warning: This icon is used to indicate that there is a danger of inhaling dangerous substances. This may lead to death or permanent injury.

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Codes and Standards Information for Air Sampling Smoke Detection

We strongly recommend that this document is read in conjunction with the appropriate local codes and standards for smoke detection and electrical connections. This document contains generic product information and some sections may not comply with all local codes and standards. In these cases, the local codes and standards must take precedence. The information below was correct at time of printing but may now be out of date, check with your local codes, standards and listings for the current restrictions.

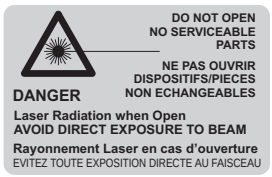
FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, the user is encouraged to try to correct the interference by one or more of the following measures; re-orientate or relocate the receiving antenna, increase the separation between the equipment and receiver, connect the equipment to a power outlet which is on a different power circuit to the receiver or consult the dealer or an experienced radio/television technician for help.

FDA

This Xtralis product incorporates a laser device and is classified as a Class 1 laser product that complies with FDA regulations 21 CFR 1040.10. The laser is housed in a sealed detector chamber and contains no serviceable parts. The laser emits invisible light and can be hazardous if viewed with the naked eye. Under no circumstances should the detector chamber be opened.

The laser chamber is identified by the label shown below:



AS1603.8

The performance of this product is dependent upon the configuration of the pipe network. The pipe network must be installed and maintained in accordance with the designs described in this Product Guide. Should you require a design that differs from those described in this Product Guide, contact your authorized Xtralis representative to discuss an alternate solution.

The product is not intended to be mounted in hostile environments but is able to sample from hostile environments.

Regional Regulatory Requirements and Notices

EN 54-20

- The product must use a power supply conforming to EN 54-4.
- The product is compliant with EN 54-20 sensitivity requirements provided the sensitivity setting provided in Table 3-2 are followed.
- The product is compliant with EN 54-20 flow monitoring requirements provided the flow fault limits (DIP switch 8 – see Table 5-1) are set to ±20%.

Product Listings

- UL
- ULC
- ActivFire
- CE
- LPCB
- VNIPPO

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1 Introduction

The VESDA VLQ is an Aspirating Smoke Detector (ASD) that provides very early warning of fire conditions by drawing air samples through sampling holes located in an air sampling pipe network.

The VESDA VLQ detector is specifically designed to cater for small areas up to 100 m² (1000 ft²). VESDA VLQ is suited to several applications, including but not limited to:

- Telecommunications land line remote offices
- Base station controllers (BSC)
- Base transceiver stations (BTS)
- Server rooms
- Datacenter containers
- IT/equipment cabinets
- Controlled environmental vaults (CEV)
- Semi-conductor tools
- Modular laboratories
- Anechoic chambers
- Flight simulators
- Generator enclosures
- Signaling huts
- Pump houses
- Ammunitions holding areas
- Hyperbaric chambers
- Barracks self-contained units

Connection to the detector using Xtralis QSC software is available via the USB interface.

Figure 1-1: VESDA VLQ

The detector contains dry-contact relays which allow connectivity to fire warning and fire suppression release systems, and integration into a building management system (BMS).

Notes:

- The VESDA VLQ does not have a single exhaust to allow back venting to the protected area (i.e. piping the exhaust ports back to the protected area), hence it is only suitable to protect areas where there is no significant pressure difference (i.e. <5Pa) between the sampling holes and the exhaust ports of the detector.
- Units requiring AS1603.8 compliance are provided with a raised LED shroud. Refer to Figure 1-2 below.

Figure 1-2: AS1603.8 compliant VESDA VLQ

1.1 Features

The VESDA VLQ detector provides the following features:

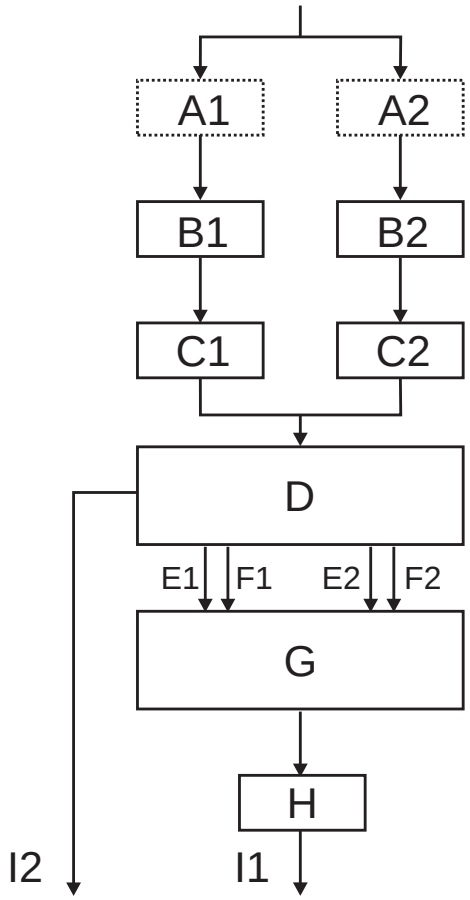
- Laser-based absolute smoke detection
- Clean air barriers for optics protection
- Up to 100 m² (1000 ft²) coverage
- Up to 2 x 6m (2 x 20ft) pipes (straight), up to 2 x 9m (2 x 30ft) pipes (branched)
- 2 or 4 VEWFD / EWFD (NFPA76), or 2 or 4 Class A / Class B (EN 54-20) sample holes
- Metric/Imperial pipe inlets
- Pre-alarm, Alarm and Fault Relays
- 5 LEDs: Pre-alarm, Fire-alarm, Fault, Power, Filter replacement
- Monitored on-board filter
- AutoLearn Smoke
- General Purpose Input (GPI)
- IP30 enclosure
- Xtralis QSC software support
- USB for direct PC connection
- Event log
- Low power consumption

2 Product Information

2.1 How it Works

The VESDA VLQ detector continually samples air from the protected environment via two pipe inlets for the sampling pipes on each side of the pipe inlets (A1, A2). Upon entering the detector, the air passes through respective inlet manifolds (B1, B2) and the aspirators (C1, C2). The sampled air then enters the filter (D) where the majority is exhausted out through filter exhaust (I2) and a portion from each inlet is separated into two pathways, one pathway enters as clean air (E1,E2) and the other pathway enters as sampled air (F1,F2) into the detection chamber (G). Sampled air is used for smoke detection and the clean air used for optics protection. After smoke detection the air is exhausted out of the chamber exhaust (I1). Flow measurement is performed at the chamber exhaust (H).

Note: Exhaust ports I1 and I2 should be vented to the same pressure as the sampling holes.



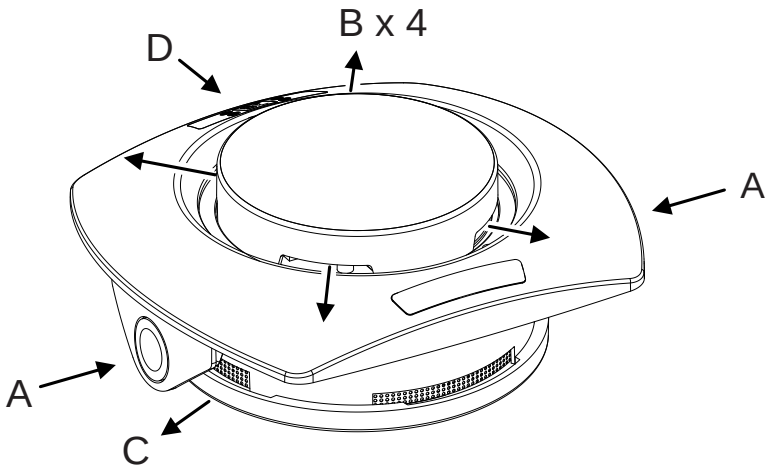
Legend	
A	Pipe Inlets
B	Manifolds
C	Aspirators
D	Filter
E	Clean Air
F	Sample Air
G	Detection Chamber
H	Flow Sensor
I	Exhaust

Figure 2-1: Air Path

2.2 Detector Overview

The VESDA VLQ detector is a lightweight unit designed to be ceiling or wall mounted and operates with a simple sampling pipe network. The detector unit features two sampling pipe inlets, unobtrusive exhaust vents, a simple control panel and display, and a buzzer to provide audio notifications.

A USB port, described below in Section 2.2.3, provides the ability to interface with a computer, which allows configuration with the Xtralis QSC software. Configuration DIP switches and wiring terminals are located beneath the detector and are accessible by removing the detector base..



Legend	
A	Sampling Pipe Inlets
B	Exhaust Vents
C	Chamber Exhaust
D	Control Panel and Display

Figure 2-2: VESDA VLQ Detector Overview

2.2.1 Front Panel

The VESDA VLQ front panel contains a series of indicators and buttons. These are described below.

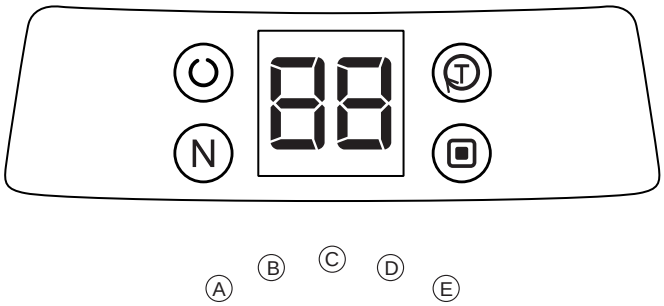


Figure 2-3: VESDA VLQ Front Panel and Status LEDs

Indicators

The VESDA VLQ detector provides information via a series of Status LEDs.

Table 2-1: LED Indicators

LED		Color	Description
A	Power	Green	The Power LED illuminates when the detector is powered up.
B	Filter Replacement	Yellow	The Filter Replacement LED is lit when the filter is due for replacement.
C	Fault	Yellow	The Fault LED is lit when a fault condition is detected.
D	Pre-Alarm	Red	The Pre-Alarm LED is lit when the Pre-Alarm threshold is reached.
E	Fire-Alarm	Red	The Fire LED is lit when the Fire threshold is reached.

Buttons

The VESDA VLQ detector provides accessibility to a range of functions via a set of control buttons.

Table 2-2: Control Buttons

Button		Description
Reset / Silence		Resetting the detector unlatches all latched alarms and faults, returns relays to their normal state and clears the active event list. Silencing silences the buzzer for the current fault. • To reset the detector, press this button once, 'rs' is displayed on the panel. • To silence the buzzer, press and hold this button till "SI" is displayed on the panel (5 to 10 seconds). SI is displayed alternately with the highest priority fault code. The buzzer will remain silent unless another fault is reported. • To take detector out of Silence mode, press this button once while detector is displaying "SI". While the filter is removed, pressing the Reset / Silence button once will reset the filter use percentage value.
Disable / Standby		Disabling the detector disables all relay outputs with the exception of the fault relay. The aspirator remains active. Standby shuts down the aspirator and puts the detector standby mode. There is no smoke detection during standby, and the fault relay is activated. • To disable the detector, press this button once. • To re-enable the unit, press the button while "db" is displayed on the panel. • To place the detector in standby mode, press and hold this button until "Sb" is displayed on the panel (5 to 10 seconds). To take detector out of standby mode, push and hold this button when "Sb" is displayed on the panel (5 to 10 seconds). **Note:** You must be logged on to the detector through front panel to use this button. Refer to Section 5.1 for further information.
Test		Two Test modes are available: • **Lamp and Buzzer Test:** Press this button to ensure that all LEDs, display segments and buzzer operate correctly. "Lt" is displayed momentarily when the button is pressed. • **Alarm and Fault Test:** Press and hold this button until "At" is displayed on the front panel (5 to 10 seconds). It activates alarm and fault relays. To stop the test press and hold this button when "At" is displayed on the panel. **Note:** You must be logged on to the detector through front panel to use this button. Refer to Section 5.1 for further information.

Table 2-2: Control Buttons (continued...)

Button		Description
Normalize Airflow / AutoLearn Smoke	N	Airflow Normalization sets the reference point for airflow thresholds based on ambient operating conditions. AutoLearn Smoke sets the alarm thresholds based on the environmental conditions. • Press this button once to start the flow normalization, 'no' is displayed on the panel. Normalization takes between 5 to 10 minutes. To cancel normalization press this button while 'no' is displayed. • To start the AutoLearn smoke press and hold this button till "AL" is displayed on the panel. AutoLearn takes 15 minutes to complete when started from the panel. To cancel the AutoLearn press and hold this button when "AL" is displayed. **Notes:** • AutoLearn Smoke thresholds are volatile, therefore if thresholds are set using AutoLearn smoke then it must be run each time the detector is powered up. • AutoLearn Smoke over-rides the DIP switch settings within the smoke threshold range. Refer to Section 5.3 for further information. • You must be logged on to the detector through the front panel to use this button. Refer to Section 5.1 for further information.

2.2.2 Buzzer

The buzzer will sound under the following conditions:

- During power up self testing.
- When a Pre-Alarm is raised, the buzzer will alternate between on and off until the detector is silenced or the smoke is no longer present.
- When a Fire alarm is raised, the buzzer will beep continuously until the detector is silenced or the smoke is no longer present.
- When a Fault is detected, the buzzer will alternate between on and off until the detector is silenced or the fault condition is corrected.
- During a manually initiated system test.

2.2.3 USB Port

Detector configuration can be performed using the Xtralis QSC software installed on a computer connected to the detector via the USB port. The USB port is located on the outside of the detector, beneath the shroud. It is necessary to remove the rubber grommet in order to access this port.

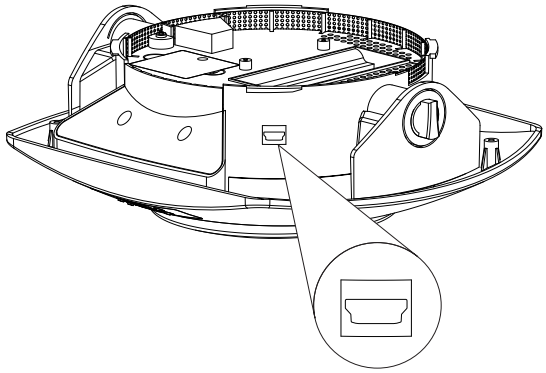


Figure 2-4: USB Port

2.3 Specifications

Table 2-3: VLQ Detector Specifications

Specification	Value
Supply Voltage	24 VDC nominal (18 to 30 VDC), externally supplied from UL1481 / EN54-4 listed power supply (as appropriate to meet local codes). Ensure that the power supply is installed in accordance with local electrical codes.
Current Consumption	170 mA (quiescent), 190 mA (alarm)
Dimensions	260 mm x 228 mm x 110 mm (10.24in x 8.98in x 4.35in)
Weight	1.2 Kg (2.65 lbs)
Operating Conditions (To operate the VESDA VLQ detector outside these parameters please contact your nearest Xtralis Office.)	**Temperature:** • Tested to: -10°C to 55°C (14°F to 131°F) * • Recommended Ambient: 0°C to 39°C (32°F to 102°F) **Humidity:** • 10-95% RH, non-condensing
Sampling Pipe Network	**Pipe Length:** • Linear: Up to 2 x 6 m (2 x 20 ft.) • Branched: Up to 2 x 9 m (2 x 30 ft.) **Sampling Holes:** • 2 or 4 (1 or 2 per pipe) Refer to Section 3.4 on page 14 for further information.
Pipe Size	Accepts both metric and American standard pipe sizes: • Metric: 25 mm (1.05 in.) • American Pipe: IPS 21 mm (¾ in.)
Relays	• 3 relays. Pre-Alarm, Fire and Fault • Contacts rated 2A @ 30 VDC • Programmable to latch or non-latch states • Programmable 0 - 60 sec delay for each relay
IP Rating	IP30
Mounting	Surface or flush mounting with optional mounting brackets.
Cable Access	• Two cabling inlet points from top • Side entry through removable partition
Cable Termination	Screw terminal blocks (0.2-2.5 sq mm, 30-12 AWG)
PC Connection	USB (Type 2)
Sensitivity Range	0.005% - 3% obs/m (0.0015% - 0.915% obs/ft)
Threshold Setting Range	• **Fire Alarm:** 0.15%/m - 3%/m (0.046%/ft - 0.915%/ft) • **Pre-Alarm:** 0.1%/m - 1.5%/m (0.03%/ft - 0.457%/ft)

* Product UL listed between 0°C to 39°C (32°F to 102°F)

Table 2-4: Software Features

Specification	Value
Event Log	Up to 1,000 events

Table 2-4: Software Features (continued...)

Specification	Value
AutoLearn Smoke	• **Minimum:** 15 minutes • **Maximum:** 2 Hours (through Xtralis QSC) • **Recommended minimum period:** 1 hour Thresholds are automatically changed from the previously set values to the updated values after the AutoLearn process has completed. AutoLearn Smoke over-rides the DIP switch settings within the smoke threshold range.
Maintenance Aids	• Event log • Smoke log

2.3.1 Ordering Information

Table 2-5: Ordering Information

Part Number	Description
VLQ-100	Detector
VSP-890	Surface Mount Kit
VSP-891	Flush Mount Kit
VSP-892	Replacement Filter
VSP-892-20	Replacement Filter - 20 pieces
VSP-893	Pipe Kit (Metric)
VSP-893-US	Pipe Kit (Imperial)

2.4 Dimensions

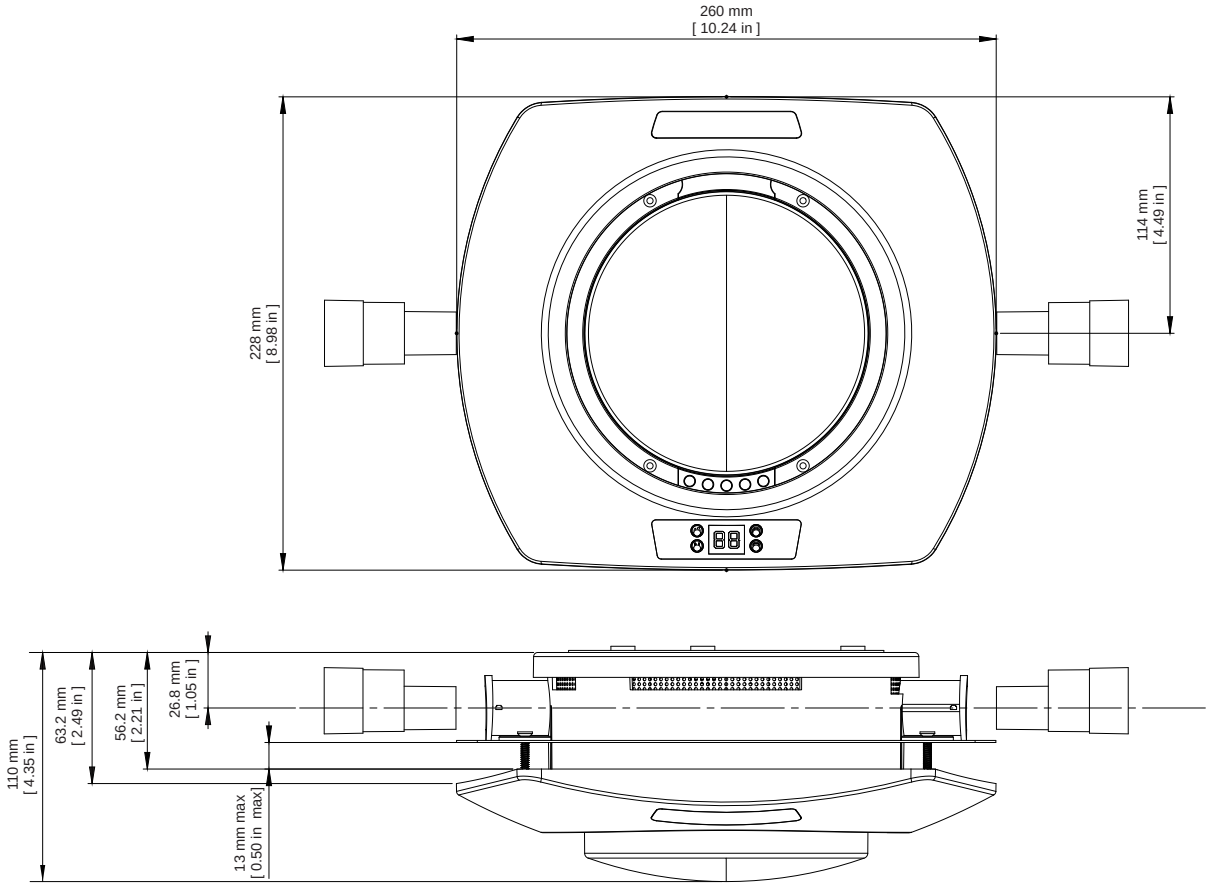


Figure 2-5: Detector Dimensions

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3 Air Sampling Pipe Network

The detector uses two linear pipes of up to 6 m (20 ft) or two branched pipes of up to 9 m (30ft) to cover a maximum of 100 m² (1000 ft²). Short pipes can be used to suit the installation.

3.1 Installation Considerations

The following points should be considered when installing sampling pipe:

- Minimize flexing in sampling pipes by supporting the pipe every 1.5 m (5 ft) or less, or at a distance described in local codes and standards.
- Sampling pipe fits firmly into the tapered detector port, DO NOT glue this connection.
- Allow sufficient movement at the detector to permit pipe removal for maintenance.
- Pipe ends must be made smooth for bonding.
- Sampling holes must be drilled in line and perpendicular to the pipe.
- Sample holes must be clear of rough edges and debris.
- Ensure that all sampling holes are from within a single space (not physically different areas separated by walls).
- Ensure that there is no significant pressure differential between sampling holes and exhaust ports.
- Pipes are free of debris.
- All joints must be glued except the pipes entering the detector.

Notes:

- Sampling holes should face into the direction of airflow, or point downwards in static airflow situations. For return air sampling refer to the notes in Section 3.4 on page 14.
- For code-specific information, see Codes and Standards Information for Air Sampling Smoke Detection on page iii.

3.2 Pipe Inlets

The VESDA VLQ detector supports two sampling pipes. Both pipes must be connected for proper detector operation.

The air inlet ports are tapered such that they accommodate both 25 mm (1 in) or IPS ¾ inch (1.05 in outer diameter) pipes. Each air inlet port allows maximum insertion of the sampling pipe to a depth of 15 mm (0.60 in).

While connecting the detector to the pipe network:

- Square off and de-burr the end of the sampling air pipes, ensuring the pipes are free from debris.
- Insert the pipes into the pipe inlet(s) ensuring a firm fit.

Note: DO NOT glue the pipes to the pipe inlets.

3.3 Exhaust Air

Air is expelled from the detector via the filter and after the detection chamber into the area where the detector is located. Refer to Figure 2-2 on page 6.

There should be no significant pressure differential between the sampling holes and the exhaust ports.

3.4 Air Sampling Configurations

Both inlets must be fitted with pipes with 1 or 2 holes and the configuration must comply to the rules in Table 3-1 below.

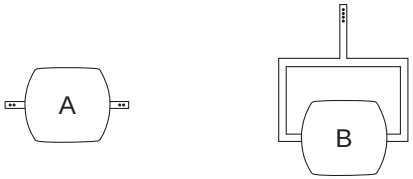
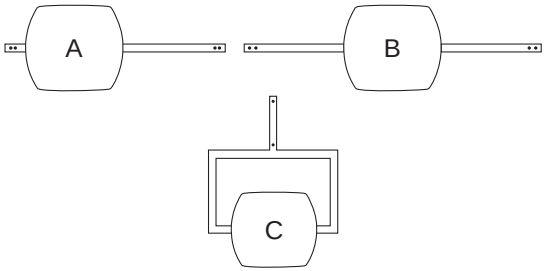
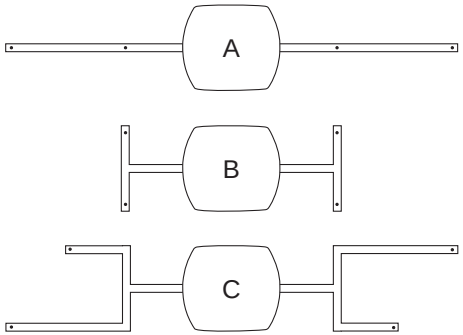
Table 3-1: Pipe and Sampling Hole Rules

Description	1 hole per pipe	2 holes per pipe	Combined Inlet
Minimum pipe length per inlet	15 cm (6 in)	15 cm (6 in)	n/a
Maximum linear pipe length per inlet / combined inlet from detector to furthest sampling hole	6 m (20 ft)	6 m (20 ft)	6 m (20 ft)
Maximum branched pipe length per inlet (total)	n/a	9 m (30 ft)	n/a
Maximum distance in branched pipe from detector to furthest sampling hole	n/a	6 m (20 ft)	n/a
Furthest sampling hole distance from the detector	6 m (20 ft)	6 m (20 ft)	6 m (20 ft)
Hole sizes per pipe / combined inlet pipe	1 x 6.5 mm (1/4")	2 x 4.5 mm (11/64")	2 x 6.5 mm (1/4") or 4 x 4.5 mm (11/64")
Maximum capillary length	30 cm (1 ft)	30 cm (1 ft)	30 cm (1 ft)

Notes:

- Ensure that all sampling holes are from within a single space (not physically separated by walls).
- Ensure that there is no significant pressure differential between sampling holes and all exhaust ports.
- Ensure that the number of bends does not exceed four (4) per inlet and per branch.
- Do not use a single VLQ to perform ceiling and return air grille detection.
- For return air grille detection, the pipe can be routed to the return air grille whilst the detector is installed away from the return air grille. The sampling holes must be oriented 30° to the incoming airflow direction.
- Ensure that the air sampling configuration complies to local codes and standards.
- Ensure that the rules in Table 3-1 are followed when a single hole per inlet or two holes per inlet are used.
- When the air sampling pipes are unbalanced, for example configurations 2A, 3B, 4C shown in Table 3-2 below, smoke entering the holes closer to the detector will trigger an alarm earlier than smoke entering the furthest holes.

Table 3-2: Air Sampling Configurations

No. of Sampling Locations	Example Detector Configurations	Description	Fire-Alarm Threshold Setting Upper Limit - %/m (%/ft)		
			NFPA76 VEWFD / EN 54-20 Class-A	NFPA76 EWFD / EN 54-20 Class-B	NFPA76 SFD / EN 54-20 Class-C
1		These are the recommended configurations for small protected areas where a single sampling location is required. • **A:** 2 x 4.5mm (11/64") holes per inlet or 1 x 6.5mm (1/4") hole per inlet. • **B:** 4 x 4.5mm (11/64") or 2 x 6.5mm (1/4") holes close to each other for a combined inlet configuration.	0.4 (0.125)	0.8 (0.25)	3 (0.915)
2		These are the recommended configurations for small protected areas where two sampling locations are required. • **A, B:** 2 x 4.5mm (11/64") holes per inlet or 1 x 6.5mm (1/4") hole per inlet. • **C:** 2 x 6.5mm (1/4") holes	0.2 (0.063)	0.4 (0.125)	3 (0.915)
3		These are the recommended configurations for protected areas where three sampling locations are required. • 2 x 4.5mm (11/64"in) holes per inlet.	0.15 (0.046)	0.3 (0.094)	2 (0.625)
4		These are the recommended configurations to maximize the area coverage with four sampling locations. • 2 x 4.5mm (11/64") holes per inlet.	0.15 (0.046)	0.3 (0.094)	2 (0.625)

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4 Installation

The VESDA VLQ detector is shipped with the following components:

- VESDA VLQ detector, including base
- Flush Mount or Surface Mount bracket kits (ordered separately)
- Stub pipes and end caps (ordered separately)

Check all components for damage and refer any concerns to your authorized representative.

It may be necessary to procure the following items:

- Generic third party wiring junction box
- Type A to Mini Type B USB Interface Lead for configuration purposes.

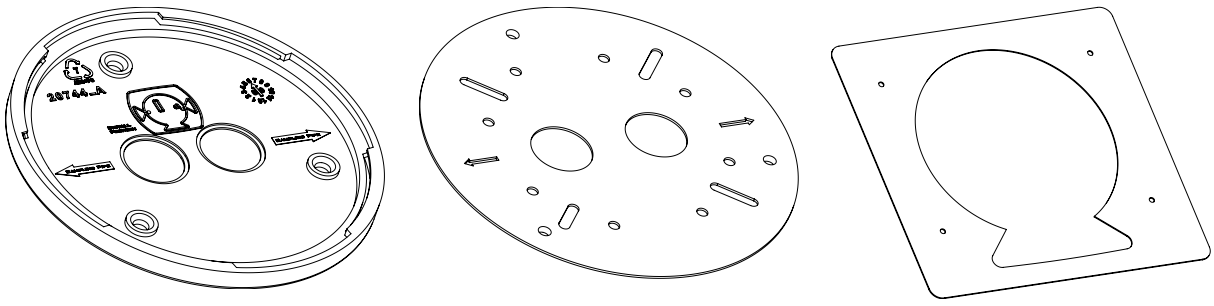
Figure 4-1: Type A to Mini Type B USB Interface Lead

Note: The supplied USB port rubber grommet on must be fitted when the USB port is not in use.

4.1 Mounting

Depending on the type of surface, the VESDA VLQ detector can be installed in different ways to suit environmental, aesthetic and local code requirements. There are several mounting techniques described in this section to suit different mounting surfaces

The detector base is used in all mounting techniques in conjunction with either the surface mount bracket or flush mount bracket to secure the detector to the mounting surface.



Detector Base **Surface Mount Bracket** **Flush Mount Bracket**

Figure 4-2: Detector base and mounting brackets

When the detector is attached to the detector base, the sampling pipes on the detector must be aligned with the sampling pipe markers on the base. Push the detector into the base on 45 degree counter-clockwise rotation, then rotate 45 degrees clockwise to lock into place. The detector is secured to its base with with two screws.

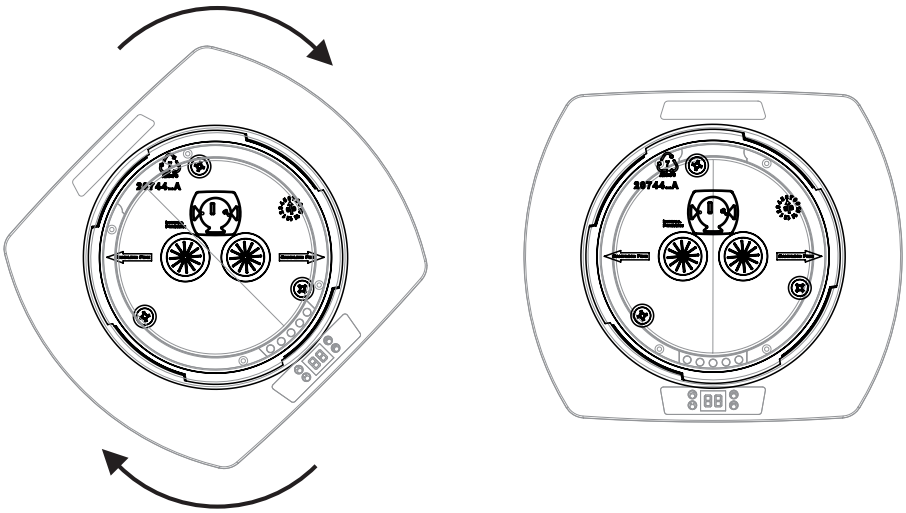
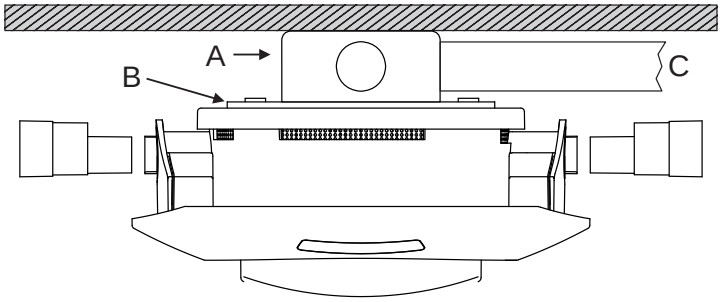


Figure 4-3: Fit detector to base and rotate clockwise

4.1.1 Surface Mount on Hard Ceiling / Wall

4.1.1.1 Mounting with Junction Box

This mounting technique is used where conduit and cable entry is required on the surface of the wall or ceiling.



Legend	
A	Generic third party Junction Box
B	Surface Mount Bracket
C	Electrical Conduit

Figure 4-4: Ceiling mounted with Junction Box

1. Secure the Junction Box (A) to the hard surface with appropriate fasteners.
2. Connect wiring conduit (C) to Junction Box and pass the wires through.
3. Remove the detector base from the detector body by holding the detector body and rotating the base anti-clockwise.
4. Pass wires through the detector base and screw the detector base to the Surface Mount Bracket (B).
5. Screw the surface mount bracket to the junction box and pass the wires through its holes, ensuring that the sampling pipe inlet arrows on the surface mount bracket are appropriately positioned.
6. Feed wires through the wire retaining strip on the base of the detector and attach to the appropriate terminal block connectors.
7. Fit the terminal block connectors to the appropriate sockets on the terminal block.
8. Align detector body to the base so that there is room to rotate it clockwise, ensuring that pipe inlets match the arrows shown on the detector body.
9. Insert pipes into the pipe inlets and seat them tightly.
10. Use the supplied M3x10 self tapping screws to secure the detector to the detector base where detector base has two tabs to secure with the detector body.

4.1.1.2 Mounting without Junction Box

This mounting technique is used where concealed cable entry is possible.

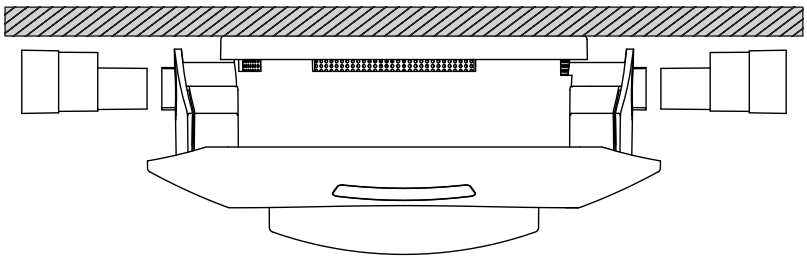
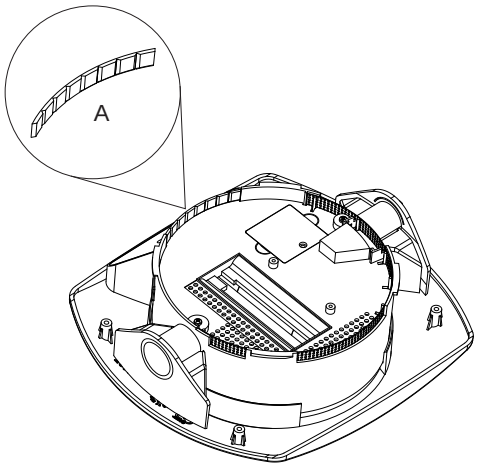


Figure 4-5: Ceiling mounted with no Junction Box

1. Remove the detector base from detector body by holding the detector body and rotating the base anti-clockwise.
2. Secure the detector base to the hard surface with appropriate fasteners, ensuring that the sampling pipe inlet arrows on the detector base are appropriately positioned.
3. Remove the appropriate number of side teeth above the sloped front panel cover (Figure 4-6) to allow wires to pass through.
4. Feed wires through the wire retaining strip on the base of the detector and attach to the appropriate terminal block connectors.
5. Fit the terminal block connectors to the appropriate sockets on the terminal block.
6. Align detector body to the base so that there is room to rotate it clockwise, ensuring that pipe inlets match the arrows shown on the detector body.
7. Insert pipes into the pipe inlets and seat them tightly.
8. Use the supplied M3x10 self tapping screws to secure the detector to the detector base where detector base has two tabs to secure with the detector body.



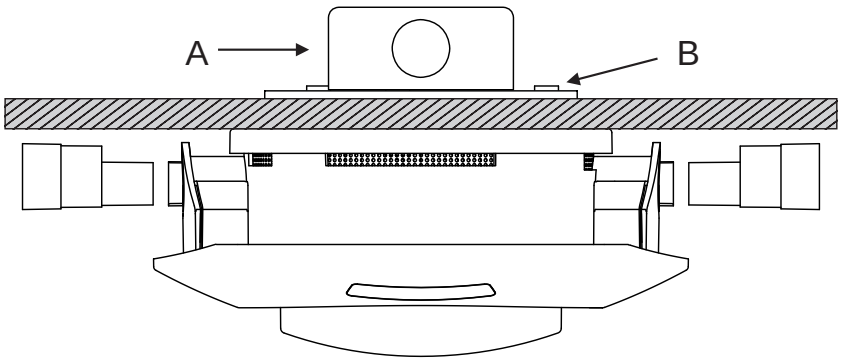
Legend	
A	Remove Teeth

Figure 4-6: Remove teeth to provide cabling access

4.1.2 Surface Mount on Suspended Ceiling Tile

4.1.2.1 Mounting with Junction Box

The Surface Mount Bracket is used behind the ceiling tile to spread the detector fixing load across a weak surface.



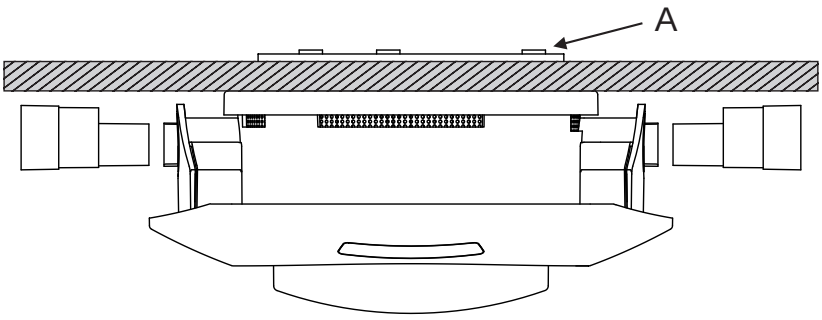
Legend	
A	Generic third party Junction Box
B	Surface Mount Bracket

Figure 4-7: Mount on suspended Ceiling Tile with Junction Box

1. Remove the ceiling tile on which installation is required.
2. Remove the detector base from the detector body by holding the detector body and rotating the base anti-clockwise
3. Use the Surface Mount Bracket (B) to mark and then cut holes for connection with the detector base (3 screws) and the holes for the wiring inlets ensuring that the sampling pipe inlet arrows on the surface mount bracket are appropriately positioned.
4. Connect wiring conduit to the Junction Box (A) and screw the Surface Mount Bracket into the Junction Box.
5. Insert Junction Box and surface mount bracket assembly from top side of the ceiling tile and screw the detector base to the surface mount bracket from the bottom side of the ceiling tile, ensuring that the sampling pipe inlet arrows on the detector body are appropriately positioned.
6. Put the ceiling tile back in its position and pass the wires through the wiring conduit, junction box, surface mount bracket holes and detector base holes.
7. Secure the Junction Box (A), wiring conduit and Surface Mount Bracket (B) in the ceiling void in accordance with local electrical codes.
8. Feed wires through the wire retaining strip on the base of the detector and attach to the appropriate terminal block connectors.
9. Fit the terminal block connectors to the appropriate sockets on the terminal block.
10. Align detector body to the base so that there is room to rotate it clockwise and then slide it into the detector body, ensuring that pipe inlets match the arrows shown on the detector body.
11. Insert pipes into the pipe inlets and seal them tightly.
12. Use the supplied M3x10 self tapping screws to secure the detector to the detector base where detector base has two tabs to secure with the detector body.

4.1.2.2 Mounting without Junction Box

The Surface Mount Bracket is used behind the ceiling tile to spread the detector fixing load across a weak surface.



Legend	
A	Surface Mount Bracket

Figure 4-8: Mount on suspended Ceiling Tile with no Junction Box

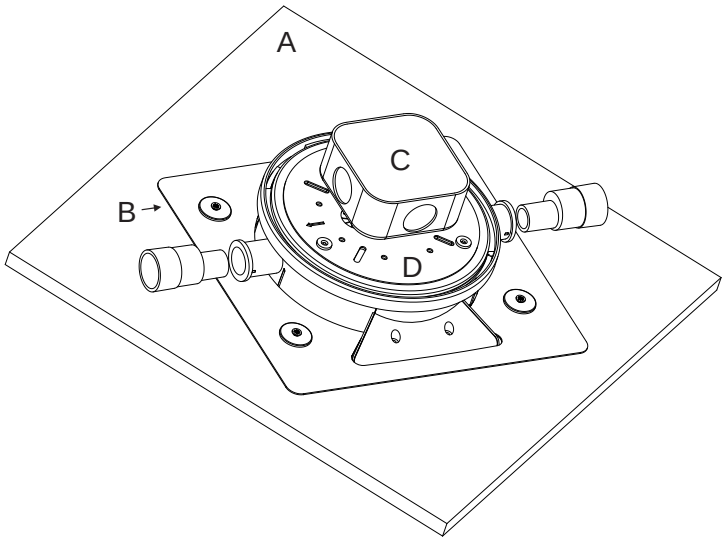
1. Remove the ceiling tile on which installation is required.
2. Remove the detector base from the detector body by holding the detector body and rotating the base anti-clockwise.
3. Use Surface Mount Bracket (A) to drill three mounting holes and two wiring holes into the ceiling tile, ensuring that the sampling pipe inlet arrows on the surface mount bracket are appropriately positioned.
4. Insert Surface Mount Bracket from top side of the ceiling tile and screw the detector base into it from the bottom side of the ceiling tile.
5. Put the ceiling tile back in its position and pass the wires through the surface mount bracket and detector base holes.
6. Secure the surface mount bracket in the ceiling void in accordance with local electrical codes.
7. Feed wires through the wire retaining strip on the base of the detector and attach to the appropriate terminal block connectors.
8. Fit the terminal block connectors to the appropriate sockets on the terminal block.
9. Align detector body to the base so that there is room to rotate it clockwise, ensuring that pipe inlets match the arrows shown on the detector body.
10. Insert pipes into the pipe inlets and seal them tightly.
11. Use the supplied M3x10 self tapping screws to secure the detector to the detector base where detector base has two tabs to secure with the detector body.

4.1.3 Flush Mount on Suspended Ceiling Tile

Flush mounting places the sampling pipes inside the ceiling cavity and the detector body in the protected area.

Note: There must be no significant pressure differential (i.e. <5Pa) between the ceiling cavity and the protected area.

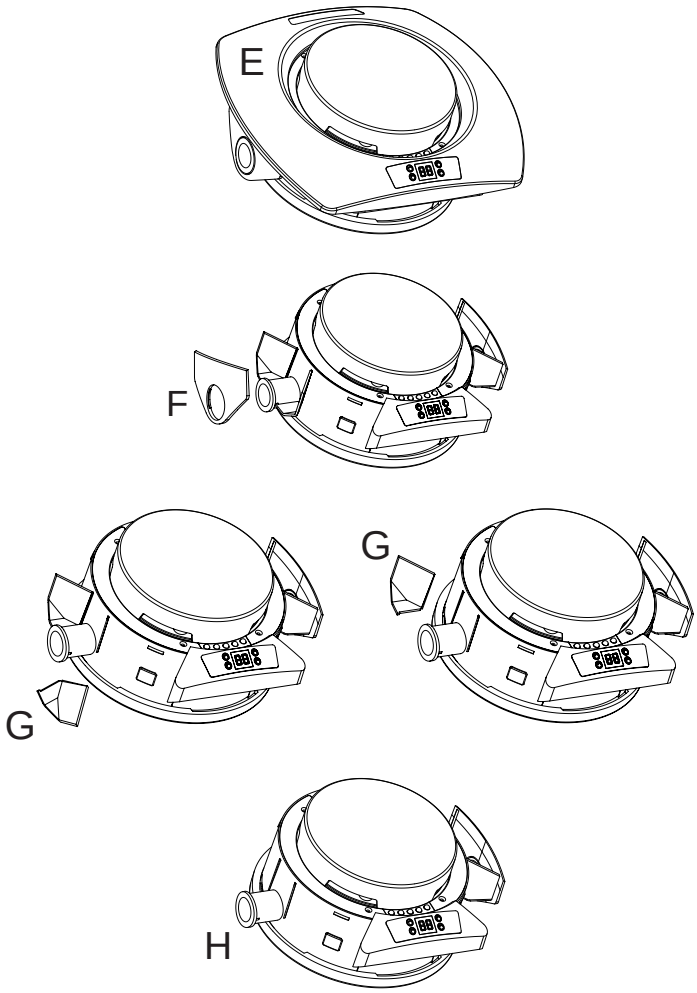
4.1.3.1 Mounting with Junction Box



Legend	
A	Ceiling Tile
B	Flush Mount Bracket
C	Generic third party Junction Box
D	Surface Mount Bracket

Figure 4-9: Flush Mount on suspended Ceiling Tile with Junction Box

1. Remove the ceiling tile (A) on which installation is required.
2. Use the Flush Mount Bracket (B) to cut the tile to pass the detector body and drill four holes for the shroud screws.
3. Remove the Shroud (E), pipe inlet fascia (F) and snap-offs (G) from both pipe inlets (Figure 4-10).

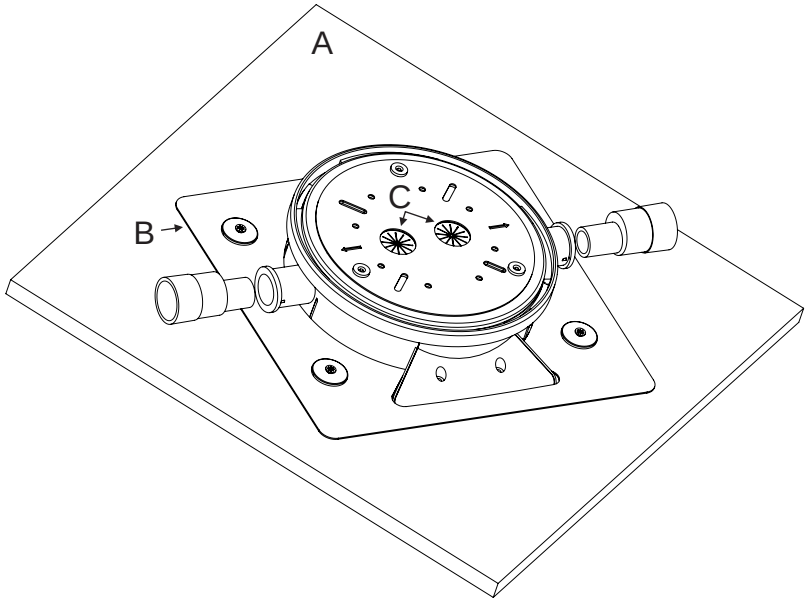


Legend	
E	Remove Shroud
F	Remove pipe-inlet fascia
G	Remove snapoffs
H	Snapoffs removed

Figure 4-10: Remove shroud, pipe inlet fascia and snapoffs

4. Place the Flush Mount Bracket (B) from the top side of the tile and screw the Shroud (E), placed from the bottom side of the ceiling tile.
5. Remove the detector base from the detector body by holding the detector body and rotating the base anti clockwise.
6. Screw the Junction Box (C) to the Surface Mount Bracket (D) with appropriate fasteners.
7. Screw the Junction Box with Surface Mount Bracket to the Detector Base, then pass the wires from the conduit through to the Junction Box (C), Surface Mount Bracket (D) and Detector Base. (Do not connect conduit to the Junction Box yet.)
8. Feed wires through the wire retaining strip on the base of the detector and attach to the appropriate terminal block connectors.
9. Fit the terminal block connectors to the appropriate sockets on the terminal block.
10. Align detector base to the detector body so that there is room to rotate it anti-clockwise and then slide the detector body into the detector base, ensuring that pipe inlets match the arrows shown on the detector body.
11. Insert the detector body from the top side of the tile and snap fit to the Shroud (E).
12. Where applicable, reposition the ceiling tile (A).
13. Connect wiring conduit to the Junction Box (C).
14. Secure the Flush Mount Bracket (B) in the ceiling void in accordance with local electrical codes.
15. Insert pipes into the pipe inlets and seal them tightly. Use short capillary tubes (maximum 30 cm / 1 ft) with appropriate sampling heads.
16. Use the supplied M3x10 self tapping screws to secure the detector to the detector base where detector base has two tabs to secure with the detector body.

4.1.3.2 Mounting without Junction Box



Legend	
A	Ceiling or Ceiling Tile
B	Flush Mount Bracket
C	Detector Base Holes

Figure 4-11: Flush Mount on suspended Ceiling Tile with no Junction Box

1. Follow steps 1 to 5 from the previous section.
2. Pass the wires through the detector base holes (C).
3. Feed wires through the wire retaining strip on the base of the detector and attach to the appropriate terminal block connectors.
4. Fit the terminal block connectors to the appropriate sockets on the terminal block.
5. Align detector base body to the detector body so that there is room to rotate it anti-clockwise, ensuring that pipe inlets match the arrows shown on the detector body.
6. Support the flush mount bracket in the ceiling void in accordance with local electrical codes.
7. Insert pipes into the pipe inlets and seat them tightly. Use short capillary tubes (maximum 30cm/1ft) with appropriate sampling heads.
8. Use the supplied M3x10 self tapping screws to secure the detector to the detector base where detector base has two tabs to secure with the detector body.

4.2 Wiring

The terminal block connectors located on the underside of the VESDA VLQ detector will accept 0.2 - 2.5 mm² or 30-12 AWG wire sizes.

4.2.1 Cabling Inlet

There are two cabling inlet ports. The ports are fitted with rubber grommets. They are not intended for wiring conduit connections. System designs that use conduit must use the optional brackets and junction box.

4.2.2 Wiring Terminals

The wiring terminals are located beneath the detector (Figure 4-12), and are accessible when the detector has been detached from the detector base.

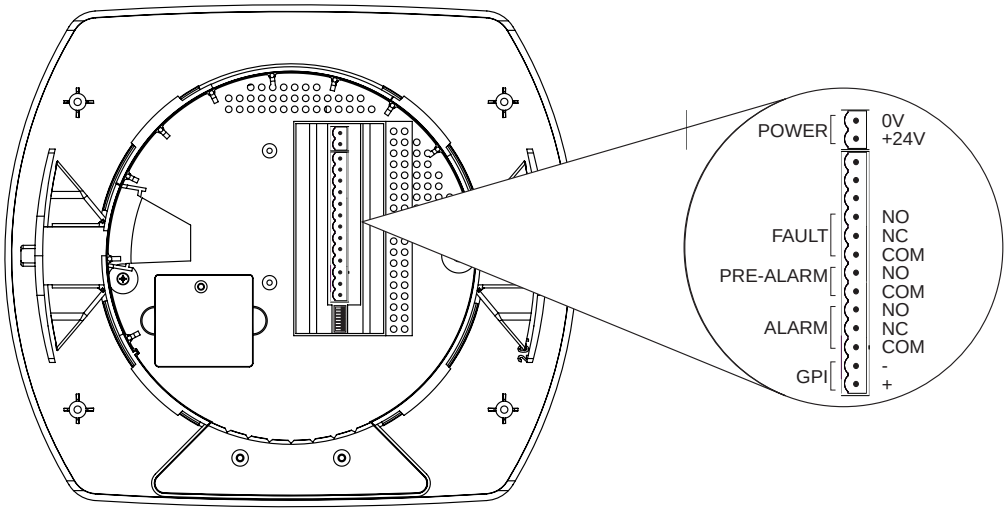


Figure 4-12: Wiring Terminals

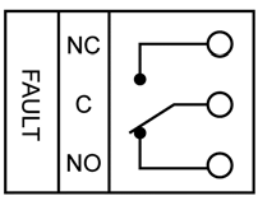
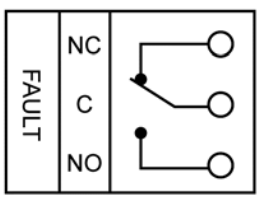
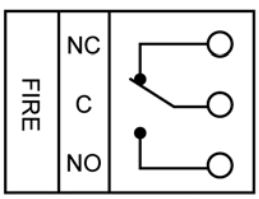
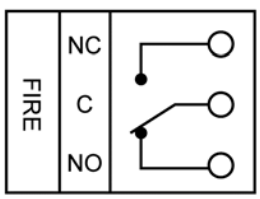
4.2.3 Relays

The relays interface to the Fire Alarm Control Panel (FACP) to communicate fault and alarm states. Refer to Figure 4-12 above for the location of the relay terminals.

FAULT, PRE-ALARM and FIRE Relay Terminals

The FAULT relay is energized during normal operation while the PRE-ALARM and FIRE relays are only energized when the respective alarm thresholds are exceeded after the configured time delay. The operation of the relays are summarized in the following table.

Table 4-1: Fault and Fire Relay Operation

FAULT Relay		PRE-ALARM and FIRE Relay	
Normal Operation (Energized)	**Fault or un-powered state**	**Normal Operation (De-energized)**	**Pre-Alarm or Fire**
			

4.2.4 Monitored General Purpose Input (GPI)

The GPI is a programmable input which can be configured to initiate a number of different actions, including, by default, a Remote Reset function. Refer to Section 7.3 on page 36 for GPI configuration options.

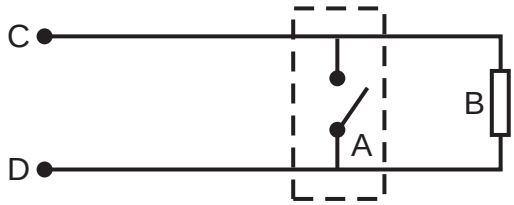
With monitored GPI, the detector monitors the GPI for open or short circuit faults when the GPI function is set to any value.

When the GPI function parameter is set to PSU monitoring, the detector indicates an external equipment fault condition by monitoring the line impedance. A 47K End of Line (EOL) resistor is supplied with the product and must be assembled in parallel with the device to be monitored.

The EOL resistor provides a known termination to the external equipment, this allows the detector to identify open or short circuits.

4.2.5 Typical Wiring for Monitored GPI for PSU Monitoring

The diagram below shows the correct way to configure power supply monitoring. It also shows where an End Of Line (EOL) resistor is correctly installed.



Legend	
A	External device (1 to N)
B	End of Line Resistor at device end of wiring
C	GPI Pin 1
D	GPI Pin 2

Figure 4-13: Power Supply Connection Diagram

4.2.6 Typical Wiring to a Fire Alarm Control Panel (FACP)

The diagram below shows the correct way to wire VESDA detectors to a conventional fire alarm control panel (FACP). It also shows where an End Of Line (EOL) resistor is correctly installed.

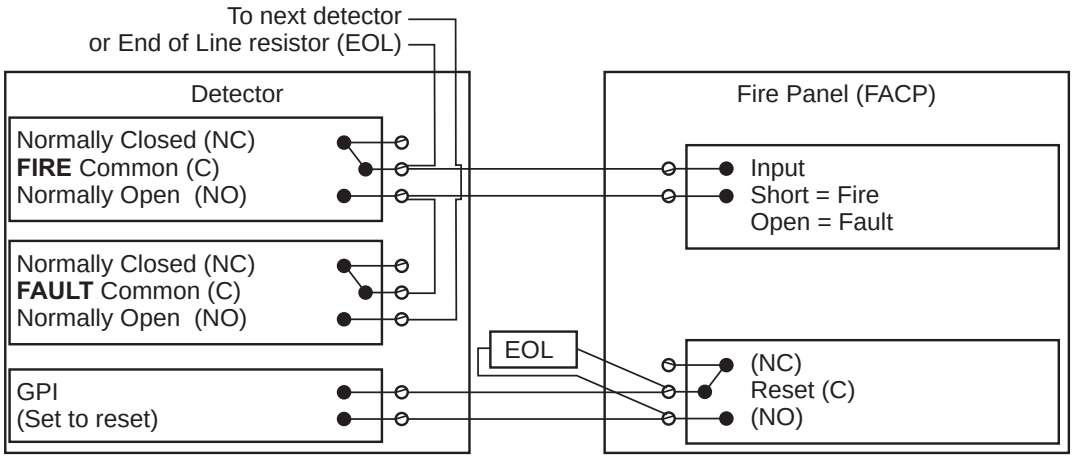


Figure 4-14: Typical wiring to a fire panel with EOL

4.2.7 Wiring to an Addressable Loop Module

This wiring example is for wiring VESDA detectors to a typical Input/Output Loop module 3 inputs 1 output.

Note: These are example drawings. Refer to the appropriate product manual for the exact wiring details of the third party equipment.

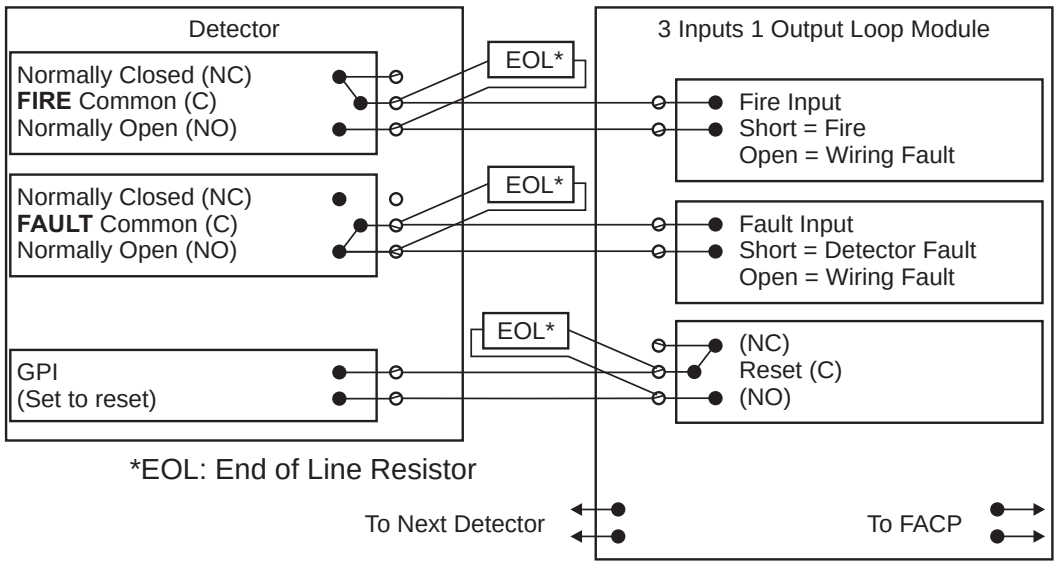


Figure 4-15: Input/Output Loop Module with EOL

4.3 Specify Backup Battery for Power Supply

In the event of a mains power supply disruption, the VLQ detector runs on a backup battery connected to the external power supply. The size of the battery is determined by:

- local codes and standards
- the total power required by the system
- back up time required
- allowance for reduction in capacity with age
- expected temperature variations

Note: It is recommended that batteries connected to the external power supply be inspected and changed as per manufacturer's specifications or as per local codes and standards.

To facilitate the calculation of the backup battery size, a Battery Calculation Sheet is included below.

Table 4-2: Calculating the size of backup battery

Equipment	**Normal loads @ 24 V DC**			**Full alarm load @ 24 V DC**		
	Load mA	**Qty**	**Total**	**Load mA**	**Qty**	**Total**
Detector	170			190		
Other 24V Loads		Total mA			Total mA	
			X			X
	Standby Hours			Alarm Hours		
			=			
	Standby Capacity			Alarm Capacity		
				Total Capacity = Standby + Alarm		
				Divided by 1000 for Standby Capacity		
				Multiply by battery factor X1.25		

4.4 Installation Checklist

Site Name	
Address	
Detector Serial Number(s) and Date of Manufacture	
Name of Installer	
Signature	
Date	

Perform the following checks listed below to ensure that all the necessary items are completed before handing over to a commissioning engineer.

Installation Checks	**Yes**	**No**
Is the detector securely locked onto the mounting surface?		
Are the sampling pipes firmly connected to the air inlet ports? Ensure that the pipes are NOT glued into the detector.		
Are all the exhaust ports venting to the same pressure as the sampling holes?		
Is power supply installed in accordance with local electrical codes and the power wires been connected to the correct terminals inside the detector?		
If required, has the GPI end of line resistor (EOL) been connected?		
Have the alarm and fault signaling wires been terminated to the correct terminals on the detector?		
Is the air sampling pipework installed and checked as per the site plans?		

4.5 Powering Up

After installing the detector it is necessary to power up the system. The power up sequence lasts approximately two minutes.

The VESDA VLQ detector does not have a power switch, i.e it is hard wired to a 24 VDC supply and it is assumed that the power supply has been installed as per manufacturers instructions in accordance with local electrical codes.

If the system fails to power up, check all power wires are secured to their terminals and that the polarity is correct.

On power up:

- The Power LED illuminates and the detector runs a series of self-diagnostic and lamp tests.
- If there is a fault, the Fault LED illuminates. To identify the fault, check the fault code on the display panel or within the Xtralis QSC software.
- The aspirator starts.

It is normal for the detector to display faults immediately after the first power up. Reset the detector using the Xtralis QSC software or the reset button on the detector. This will unlatch the relays and turn off the Fault LED. Any remaining faults will cause the Fault LED to illuminate again. Proceed with the preliminary system check.

4.6 Preliminary System Check

A preliminary system check is required after installing the VESDA VLQ detector, before it is commissioned for use. The check can be conducted by using buttons on the detector or by connecting to the detector using the Xtralis QSC software. The preliminary systems check includes:

- Normalizing the air flow. Activate the normalization process using the N button on the detector or by using Xtralis QSC.
- Conducting a basic smoke test.
- Check interface to FACP, i.e. verify alarm and fault conditions.

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5 Configuration

The VESDA VLQ detector is configured using the Xtralis QSC software or onboard DIP switches.

5.1 Logging on using the Display Panel

Prior to configuring or operating the detector using the display panel controls, it is necessary to log in to the detector.

Login Sequence

To log out of the detector, use the same sequence. Once logged in, the detector shows "Ln" on the display.

Note: When detector is logged-on from the front panel, it is not possible to log-on from Xtralis QSC, and vice-versa.

5.2 Setting the time using the Display Panel

It is possible to set the time by the detector control panel or the Xtralis QSC software.

Setting the time using Xtralis QSC

1. Log onto the detector.
2. Press the Set Time button.
3. The current Hour, Minute, Second, Year, Month and Day settings are displayed in a pop-up window. Edit as required then confirm the changes.

Setting the time using the Control Panel

1. Log on to the detector. Refer to Section 5.1 for further information.
2. Press and hold the Reset and Normalize buttons simultaneously for 5 seconds.
3. Set the hour by pressing the Test button to set the first digit, and the Disable button to set the second digit. Press the Reset button when the correct value is on screen to advance.
4. Set the minute by pressing the Test button to set the first digit, and the Disable button to set the second digit. Press the Reset button when the correct value is on screen to advance.
5. Set the second by pressing the Test button to set the first digit, and the Disable button to set the second digit. Press the Reset button when the correct value is on screen to advance.
6. Set the year by pressing the Test button to set the first digit, and the Disable button to set the second digit. Press the Reset button when the correct value is on screen to advance.
7. Set the month by pressing the Test button to set the first digit, and the Disable button to set the second digit. Press the Reset button when the correct value is on screen to advance.
8. Set the day by pressing the Test button to set the first digit, and the Disable button to set the second digit. Press the Reset button.

5.3 DIP Switch Configuration

The VESDA VLQ provides a range of configuration options using an on-board DIP Switch bank.

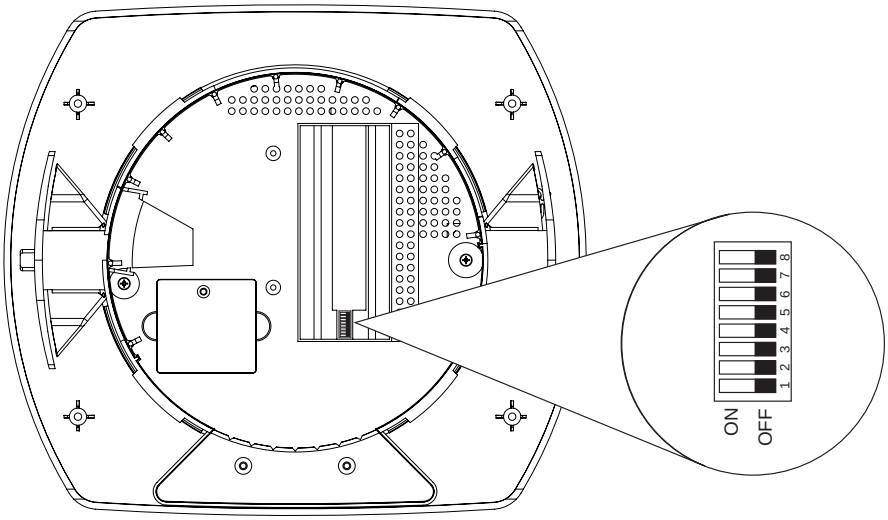

Figure 5-1: DIP Switch Location

Table 5-1: DIP Switch Configuration

Switch Position	Purpose	Configuration			Options	Default Switch Settings
		SW1	**SW2**	**SW3**		
1,2,3	Set Fire Alarm Smoke Threshold (Pre-alarm set to 50% of Fire Alarm automatically)	OFF	OFF	OFF	0.15%/m (0.046%/ft)	0.3%/m (0.091%/ft)
		ON	OFF	OFF	0.3%/m (0.091%/ft)	
		OFF	ON	OFF	0.6%/m (0.18%/ft)	
		ON	ON	OFF	0.8%/m (0.24%/ft)	
		OFF	OFF	ON	1.0%/m (0.30%/ft)	
		ON	OFF	ON	1.5%/m (0.46%/ft)	
		OFF	ON	ON	2.0%/m (0.61%/ft)	
		ON	ON	ON	3.0%/m (0.91%/ft)	
4	Set Fire Alarm Delays	OFF			No Delay	OFF (No Delay)
		ON			30s Delay	
5	Set Flow Delays	OFF			No Delay	OFF (No Delay)
		ON			30s Delay	
6	Set Fire Alarm latching	OFF			Fire Alarms not latched	ON (Latched)
		ON			Fire Alarms latched	
7	Set Fault latching	OFF			Faults not latched	ON (Latched)
		ON			Faults latched	
8	Set Flow Fault Limits	OFF			+/-20%	ON (+/-50%)
		ON			+/-50%	

6 Commissioning

The VESDA VLQ has been designed to simplify the commissioning process. The AutoLearn function allows the unit to assess its environment and setup appropriate alarm thresholds.

The detector is monitored during commissioning using Xtralis QSC.

Once the VESDA VLQ detector has been commissioned, it will report alarms and faults according to the parameters defined during installation.

Note: Detectors should be commissioned with a smoke test.

Prior to commissioning the detector:

1. Check that the pipe network is clean and correctly fitted with all joints correctly glued (except where the pipe enters the detector, which must not be glued).
2. Check that the power is connected and on. Let the detector run for around 5 minutes. Ignore the faults during this time. Reset the detector after 5 minutes of operation.
3. Normalize the airflow. This takes approximately 5 minutes.
4. Reset the detector after normalization. It should now be running without faults.

It is important that the protected environment is representative of normal operating conditions during the AutoLearn process.

For code-specific information, see Codes and Standards Information for Air Sampling Smoke Detection on page iii.

6.1 AutoLearn Smoke

AutoLearn Smoke is initiated by using controls on the front panel or from within Xtralis QSC.

During the AutoLearn Smoke process, the detector determines the average smoke and peak smoke obscuration levels and sets suitable alarm thresholds for the operating environment. This process will minimize nuisance alarms due to normal environmental background variations.

During the learning cycle, if an alarm condition occurs, AutoLearn will not complete its cycle. In this situation the user must restart the AutoLearn process. If AutoLearn is halted, the alarm thresholds will be left at the previous settings.

Conditions experienced during learning are assumed to be representative of normal operating conditions.

The AutoLearn Smoke learning times range from 15 minutes to 2 hours.

Note: AutoLearn Smoke thresholds are volatile, therefore if thresholds are set using AutoLearn smoke then it must be run each time the detector is powered up.

6.2 Commissioning Smoke Test

It is recommended that a smoke test be carried out to verify the integrity of the pipe network, to demonstrate that the system is working and to measure the transport time to the detector.

This test involves introducing a smoke sample at the furthest sampling hole and then measuring the time taken for the smoke to travel to the detector. Results are logged and compared to subsequent tests to note variations of the system.

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7 Xtralis QSC Software

Xtralis QSC is used for configuration and commissioning of the VESDA VLQ detector.

Buttons are green and change to pink when active, and only when logged on to VESDA VLQ are all the buttons are visible.

7.1 Installation

1. Install the STM virtual COM Driver. Use the 32 bit (VCP_V1.x.x_Setup.exe) or 64 bit (VCP_V1.x.x_ Setup_x64.exe) installer as appropriate for your Windows operating system.
2. Extract the Xtralis QSC executable (QSC.exe) to a folder on your PC's hard drive but do not run it before powering up the detector.
3. Connect a USB cable between the detector and the PC.
4. Apply power to the detector and wait for 40 seconds to allow the detector to finish self-testing.
5. Launch Xtralis QSC. Xtralis QSC will report “Select COM Port”.
6. Select Connection Parameters, and select the available COM port then OK.
7. Once connected, PC time and the detector time will be displayed at the bottom of the window and detector, alarm and fault status will be displayed in the status bar.

7.2 Functions

Table 7-1 below details Xtralis QSC commands (functions):

Table 7-1: Xtralis QSC Commands

Button / Function	**Action**
Logon / off	Default with Logon written. When pressed, the button turns to pink and prompts the user with another screen to log on to the VESDA VLQ unit. Press OK when the logon screen pops up. Successful logon makes other buttons visible where logon is required to perform such functions.
Reset	Resets alarms and faults when pressed and momentarily changes to Pink and back to Green when reset is completed.
Silence	Silences the buzzer and changes to Pink.
Connection Parameters	Allows to choose the communication port, change to appropriate virtual com port.
Reset Smoke Hours	VESDA VLQ stores smoke hours to determine filter usage and raises a trouble to replace the filter when certain smoke hours limit is reached. This button allows to reset the smoke hours when an expired filter is replaced with a new filter. Filter must be removed from the unit to use this function.
Lamp Test	Allows to perform LED, Buzzer and display test once.
Alarm and Relay Test	Allows to perform fire and fault relay test, prompts the user with another screen to test fire and fault relays. Alarm test simulates the smoke value to generate an Alarm condition.
AutoLearn Smoke	Allows to start AutoLearn smoke feature. AutoLearn uses background conditions to set appropriate thresholds.
Normalize Flow	This button allows air flow normalization if the detector airflow is within the acceptable range. Normalization takes approximately 5 minutes.
Disable On	Allows disabling of the detector, when disabled detector stops reporting alarms on relays.
Standby On	Allows setting the detector to standby. The detector shuts down the aspirator and stops airflow and smoke detection.

Table 7-1: Xtralis QSC Commands (continued...)

Button / Function	Action
Set Time	Allows setting of the detector time.
Get Event Log	Allows to log up to last 1000 events and stores in a CSV file (do not change any timing on the right side up down button)
Get Smoke	Allows logging of smoke at between 2 and 60 second intervals and stores in a CSV file, this is useful to determine minimum and maximum thresholds settings during the fire tests if required. It is recommended that the smoke interval is set to 10 seconds or greater. This is a live smoke data capture so Xtralis QSC must be running during this function.

7.3 Configuration

Table 7-2 below details VLQ configuration items available in the Xtralis QSC software, under Device Configuration.

Table 7-2: Configuration Items

Configuration Item	Description	Parameters / Range
Configure Device via Xtralis QSC	Allow configuration of the detector from Xtralis QSC.	Enable/Disable
Unit	Set the units of smoke	Metric/Imperial
Fire Alarm Threshold	Set the threshold of Fire alarm	0.15%obs/m - 3%obs/m (0.046%/ft - 0.915%/ft)
Pre-Alarm Threshold	Set the threshold of Pre-alarm	0.1%obs/m - 1.5%obs/m (0.03%/ft - 0.457%/ft)
Alarm Delay	Configure delay of fire alarm	0, 30, 45 or 60 seconds
Alarm Latching	Allows to latch the fire relay	Enable/Disable
Fault Latching	Allows to latch the fault relay	Enable/Disable
Flow Fault Limit	Set the limit of flow fault	+/-20%, +/-50%
Fault Delay	Configure delay of fault	0, 30, 45 or 60 seconds
GPI Configuration	Configure the GPI action	• Reset • External Device (PSU) Monitoring • Reset+Disable • Standby
Buzzer	Enable or disable buzzer	Enable/Disable

7.4 Device Information

Table 7-3 below details information for the VLQ available in the Xtralis QSC software, under Device Information.

Table 7-3: Device Information

Item	Description
Model	Displays model number
Serial Number	Displays serial number
Hardware Version	Displays hardware version
Software Version	Displays software version
Temperature	Displays current temperature
Smoke Value	Displays current smoke value
Flow Value	Displays current raw flow value
Filter Used	Display filter use percentage value

7.5 Test Functions

Table 7-4 below details test functions for the VLQ available in the Xtralis QSC software.

Table 7-4: Test Functions

Item	Description
Lamp Test	Tests LEDs, buzzer and display once. The test runs for 15 seconds.
Alarm and Relay Test	Tests relays and simulates alarm condition, prompts user with a pop-up window for pre-alarm, fire-alarm and fault relays and alarm testing. The test runs for two minutes or can be stopped by the user. Other Xtralis QSC functions are disabled during this test.
Flow Fault Test	Simulates a low flow fault condition, prompts the user with a pop-up window to start the test. The test runs for 30 seconds. Other Xtralis QSC functions are disabled during this test.
Fault Test	Simulates fault 43 once. This test automatically terminates within 5 seconds. Other Xtralis QSC functions are disabled during this test.

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8 Maintenance

To maintain the VESDA VLQ detector at its peak performance level, the recommended maintenance schedule shown in Table 8-1 below should be followed.

Table 8-1: Recommended maintenance schedule for the VESDA VLQ detector

Maintenance Check	Quarterly	Six-monthly	Annual	Biennial
Power Supply and Battery	✔			
Check Pipes		✔		
Pipe Integrity Smoke Test			✔	
Check Pipe Flow			✔	
Clean Sampling Points			✔	
Flush Pipe Network			✔	
Replace Filter				✔

8.1 Replacing the Filter

The detector reports a fault condition on the front panel and in the event log to indicate that the filter requires replacement after the recommended period of time has elapsed, or filter use percentage limit reached, whichever occurs first.

After removing the old filter and prior to inserting the new one, it is necessary to reset the filter used percentage value. This can be done using the detector controls or from within Xtralis QSC.

Requirements

Philips head screwdriver

Filter Removal Procedure

1. Rotate cover 45° counter-clockwise and remove by lifting outwards (Figure 8-1).

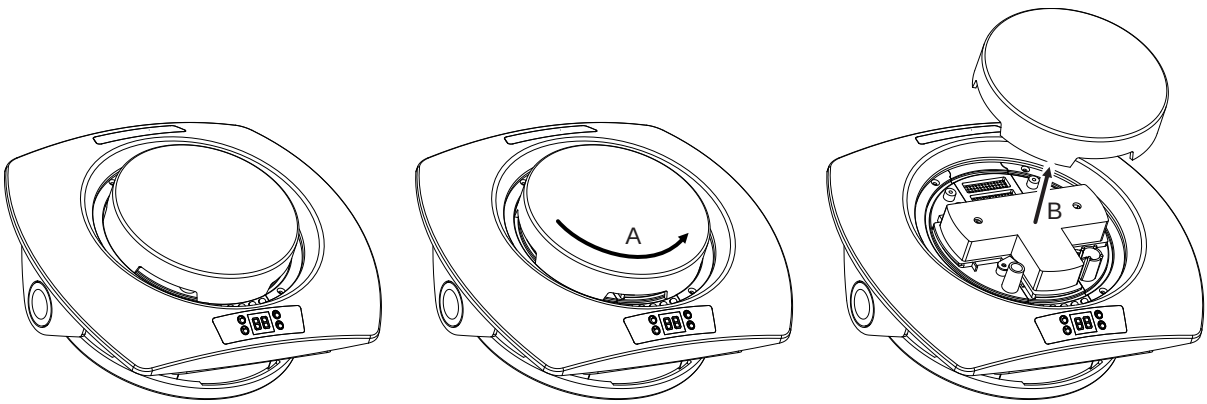

Figure 8-1: Remove the Detector Cover

2. Release the filter:

- **Where the filter is secured with a retaining bracket:** Remove screws (C) with a Philips head screwdriver and lift out the filter retaining bracket (D) (Figure 8-2).

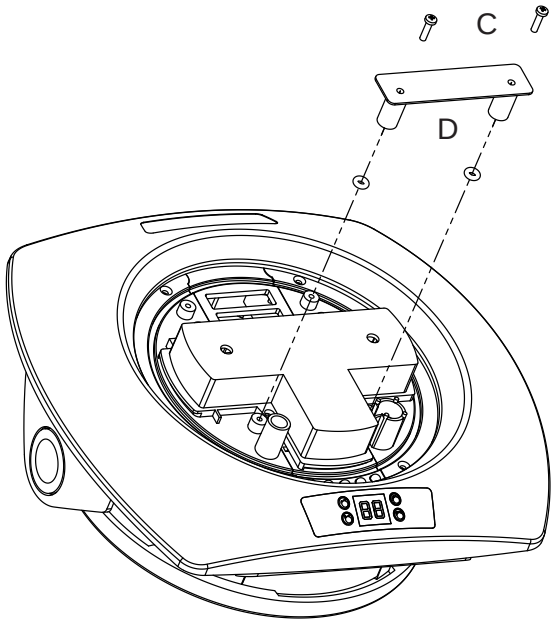

Figure 8-2: Remove filter retaining bracket

- **Where the filter is secured with retaining clips:** Whilst holding the filter housing (B), loosen the screws C and D with a Philips head screwdriver.turn the clips (E and F) outwards, away from the magnets beneath them (Figure 8-3).

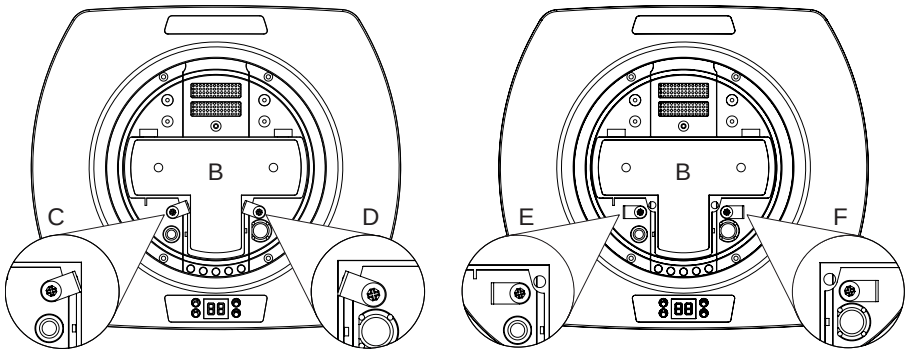

Figure 8-3: Loosen filter retaining screws

2. Lift the filter (G) out of the detector (Figure 8-4).

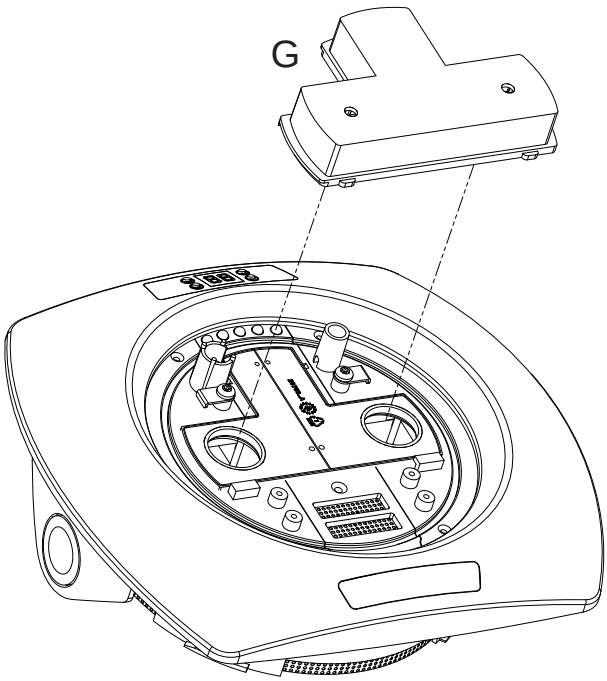

Figure 8-4: Remove Filter

Filter Insertion Procedure

1. With the filter removed from the detector, pressing Test and Disable button simultaneously displays filter use percentage value. When a new filter is used reset the filter use percentage value. To do this, press the Reset button on the front panel once, or use the Xtralis QSC software.
2. Tilt the new filter and align to the insertion guides (Figure 8-5) and lower filter into place.

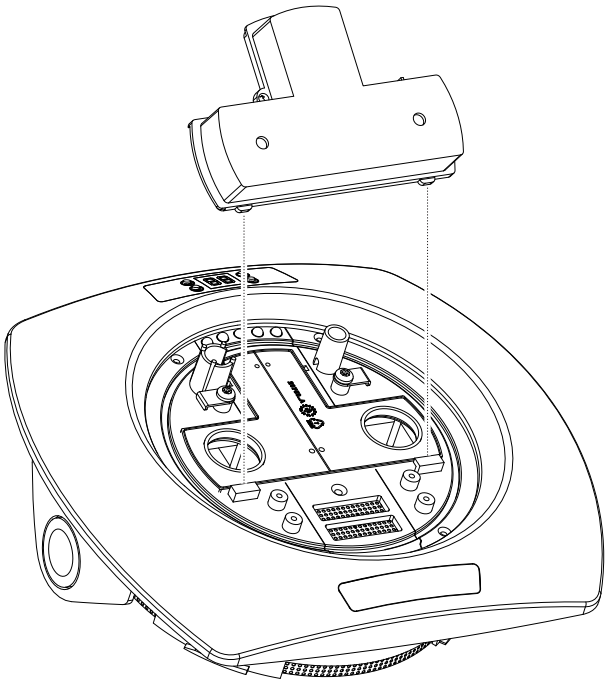

Figure 8-5: Filter insertion

3. Reposition the retaining bracket, or for units with retaining clips, realign the clips with the magnets (Figure 8-3, C and D).
4. Tighten the retaining screws using a Philips head screwdriver.

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9 Troubleshooting

9.1 Fault Codes

Fault codes can be viewed on the LED display or by using the Xtralis QSC software.

- Faults 01 though to 18 are hardware faults which require that the detector be replaced.
- Faults 41 through to 50 are generally rectifiable with minimal user interaction.
- To correct some faults, you may be prompted to log on to the detector. The login procedure is described in Section 5.1 on page 31.

Table 9-1: Fault Codes

Fault Code	Fault Type	Description	Possible Resolution
01	Detector Hardware	Self-test failed	Contact your authorized service representative.
03		EEPROM fault	
04		Calibration data EEPROM fault	
05		Configuration fault	
06		+12V fan power supply fault / main board module fault	
07		+5V power supply fault	
08		3.3V power supply fault / main board version fault	
09		Laser control circuit fault	
10		Smoke signal receive and amplification circuit fault	
11		Fans fault	
12		Flow circuit fault	
13		Ambient temperature circuit fault	
14		Fault relay control circuit fault	
15		Alarm relay control circuit fault	
16		RTC fault	
17		Chamber BG too high	
18		Chamber BG too low	
41	24V input power supply fault	24V input voltage is lower than 18V or higher than 30V.	Check PSU voltage across the 0V and +24V terminals on the rear of the unit with multimeter to ensure it is constant and between 18 - 30V DC. Adjust or replace the PSU as required.
42	Airflow Normalization Failed	The detector has been unable to establish a reference level for normal airflow.	Check the sample holes, pipe and connection to the unit for obstruction and integrity. Make corrections as required, restart the unit, wait 10 minutes then normalize again.

Table 9-1: Fault Codes (continued...)

Fault Code	Fault Type	Description	Possible Resolution
43	Autolearn Smoke Failed	The detector has been unable to establish suitable alarm thresholds during Autolearn Smoke.	Re-activate when area is smoke-free, or set suitable Pre-Alarm and Fire thresholds manually using the onboard DIP switches or the Xtralis QSC software. Refer to Section 5.3 on page 32 for further information
44	Filter Absent	Filter not fitted or fitted incorrectly	Check filter is fitted correctly or insert new filter. Refer to Section 8.1 on page 39 for further information.
45	Filter Replace	Filter life expired	Replace filter and reset filter use percentage value. Refer to Section 8.1 on page 39 for further information.
46	High Airflow	Airflow through one or both sample pipes has exceeded the acceptable high flow limit.	• Check sample pipes for damage, breaks. • Examine environment for changes that may affect airflow. If a cause cannot be found, normalize the detector.
47	Low Airflow	Airflow through one or both sample pipes has exceeded the acceptable low flow limit.	• Check sampling holes and pipe for obstruction or partial blockage. • Examine environment for changes that may affect airflow. If a cause cannot be found, normalize the detector.
48	GPI	The monitored General Purpose Input line is open or short circuit.	The End Of Line resistor provides a known termination to the external equipment. Check that the 47K EOL resistor is fitted to the GPI terminals on the back of the unit. Examine monitored device (if fitted). Refer to Section 4.2.5 on page 25 for further information.

Table 9-1: Fault Codes (continued...)

Fault Code	Fault Type	Description	Possible Resolution
49	External Device on GPI	External device failure	Check that the EOL resistor is fitted. Examine monitored device (if fitted). Refer to Section 4.2.5 on page 25 for further information.
50	Display Panel	Display panel button stuck	Attempt to release button, check that the detector housing and front panel are correctly fitted and aligned.

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